



Making extremely economical cars



April 29, 2009 by [Bruce Smith](#) | Star staff

High school students create super-efficient cars, with some getting more than 1,000 miles per gallon

A team of teens from Avon High School learned this week just how many extra miles they can coax from a gallon.

But they also learned some practical lessons about the engineering that goes into achieving mega-mileage.

The Avon team competed Monday with 48 other cars built by Indiana high school teams in the Super Mileage Challenge on the oval racetrack at O'Reilly Raceway Park in Hendricks County.

The Avon car achieved 119.77 miles per gallon to finish near the middle of the pack.

The winning car, built by Greenfield-Central High students, achieved 1,048.79 mpg using stock parts from a 3.5-horsepower Briggs and Stratton engine.

And in the unlimited class, where the cars and Briggs' engines may be modified, the team from Evansville Mater Dei High School coaxed 1,293.09 miles from a gallon of fuel.

"These are great results, but all of the teams were affected by the gusty winds," said Jim Thompson, Carmel, of the sponsoring Indiana Mathematics, Science and Technology Education Alliance.

In the 14th annual fuel mileage contest, the student-built cars took to the track powered by Briggs engines commonly used on lawnmowers, minibikes and small karts.

"The idea is that the kids in this competition learn to solve engineering problems, to work together and to get out into their community to find sponsorships and community support," Thompson said.

Avon teacher Gary Ayres said this is the fourth year for the school to enter a Super Mileage car.

"It is a great program that lets the kids learn to push the envelope of learning a little. They learn to get their hands dirty and that all problems aren't just on paper."

The Avon team's car performed a little better last year, when it achieved more than 200 miles to the gallon of fuel. "At the last minute this year, we changed from a coaster wheel to a direct drive, and that was too much drag," Ayres said.

That's the kind of decision that helps students learn and pull together their lessons in math, science, engineering, aerodynamics, drag, braking stopping power, wind resistance and other forces at work in the cars, he said.

Actually, these are not the kind of cars that most people are likely to drive, Thompson added. They're not legal on streets, and the young drivers usually have to lie on their backs and peek through their knees or feet to see the track.

But on a racetrack, several of the young drivers said they learn the tricks of super mileage.

Most limit their speed to 15 mph because that limits wind resistance. Higher speed means more drag.

And they turn off their engine and let the car coast or be pushed by the wind as much as possible on each lap.

The Avon car was fabricated from thin plywood with an outer skin of a plastic shrink-wrap to help make it smooth through the wind.

"We used to use fiberglass bodies for our car and then we switched to this system, and it cut the weight from 35 pounds down to 6 pounds. That's the kind of problem-solving the kids learn," Ayres said.

"Even if an idea doesn't always work, you still learn."

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Photos



Avon High's Caleb Burton drives his team's car. Greenfield-Central won the division with a car



Zac Buntun (right) and other members of his line during the 2009 Super Mileage Challenge contest at O'Reilly Raceway Park in Hendrick

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